REMARKS

Status of the claims:

With the above amendment, claim 1 has been amended and claims 2 and 3 have been canceled. No new matter has been added by way of the above amendment. Claim 1 is pending and ready for further action on the merits. The amendment to claim 1 has support at page 6, line 22 and original claim 3. Reconsideration is respectfully requested in light of the following remarks.

Rejections under 35 U.S.C. §103

Claims 1-3 have been rejected under 35 U.S.C. §103(a) as being unpatentable over JP '204 (JP 62-191204) in view of Japan '603 (JP 03-258603) and JP '214 (JP 10-129214) and optionally further in view of Lucas '211 (US Patent No. 5,967,211) and/or Midorikawa '784 (Canadian Patent No. 2,049,784). This rejection is traversed for the following reasons.

Present Invention

The present invention relates to a studless tire. The studless tire has glass fibers or carbon fibers having an average fiber diameter of 1 to 100 μm and an average length of 0.1 to 5 mm, which are dispersed in a diene rubber in an amount

of 3 to 20 parts by weight based on 100 parts by weight of the diene rubber. The glass fibers or carbon fibers are oriented in such a way in the thickness direction of the tread, that the complex elastic modulus E1 in the thickness direction of the tread and an elastic module E2 in the circumferential direction of the tire measured at 25°C satisfy the equation $1.1 \leq E1/E2 \leq 4$. The hardness of the tread rubber measured at -10°C is 45 to 75 degrees.

Disclosure of JP '204

JP '204 discloses a skid-proof tire that is comprised of 5 to 60 parts by weight of an anti-slip agent such as organic fibers, glass, carbon, ceramics, or metal, which is blended in with 100 parts by weight tread rubber. The anti-slip agent is exposed to the outer surface of the tread rubber. The anti-slip agent is composed of short filament-like fibers arranged orthogonal to the outer surface of the tread. The tire reduces dust generation.

Disclosure of JP '603

JP '603 discloses a pneumatic tire for driving on icy roads with fiber bundles buried in the tread rubber. The rubber does not penetrate into the bundle core, and the ends of the fibers

are exposed on the tread surface. The hardness of the tread rubber is between JIS 45 and JIS 50.

Disclosure of JP '214

JP '214 discloses a tire wherein the strength is said to improve by changing the orientation of the short fiber in a rubber block and a base tread. In particular, JP '214 discloses a tread for an off-road tire that comprises a rubber block and a base tread. The short fiber (in the rubber composition to constitute the tread) is oriented in the radial direction from the center of a tire in the rubber block, and oriented in the circumferential direction of the tire in the base tread. The strength in the circumferential direction of the tread for the off-road tire to be obtained is increased by arranging the short fiber in the base tread in the circumferential direction of the tire. The chunking resistance and the edge chipping resistance of the rubber block are improved by arranging the short fiber in the rubber block in the radial direction (Z-axis direction) from the center of the tire. The rubber composition used in the tread for any regular tire may be acceptable.

Disclosure of Lucas '211

Lucas '211 discloses a tire with a rubber tread reinforced with silica and containing one or more additives designed to aid

ice traction for the tread. The additive is selected from at least one of (i) at least one organic fiber having hydroxyl groups on the surface thereof selected from cellulose fibers and wood fibers and (ii) small, hollow, spherical ceramic particles having silanol groups on the surface thereof. The rubber is composed of at least one or more diene-based sulfur vulcanizable elastomers having a Tg of less than -30° C and containing silica as the predominant particulate reinforcement and other traditional rubber compound ingredients. In particular, a coupler is used to couple the silica as well as the said additive(s) to the elastomer(s) in the tire tread composition.

Disclosure of Midorikawa '784

Midorikawa '784 discloses a studless pneumatic tire which comprises a tread compound formed from a cellular rubber and short fibers of a specified average length and a specified average diameter distributed and specifically oriented within the cellular rubber, which has a selected set of physical properties.

Removal of the Rejection over JP '204 in view of JP '603 and JP '214 and optionally further in view of Lucas '211 and/or Midorikawa '784

Claim 1 has been amended so that the short fibers in claim 1 are glass fibers or carbon fibers and that the proportion is 3-20 parts by weight.

Using glass fibers is disclosed in JP '204 and JP '603 but neither patent discloses any working examples using these fibers. Further, there is no suggestion or disclosure of amounts of the glass or carbon fiber to be added. Moreover, in JP '603, the fact that the short fibers are not dispersed but buried within the rubber compound differs from the present invention in which the short fibers are dispersed within the rubber compound.

Lucas '211 as well as JP '214 only refer to organic fibers and do not mention glass or carbon fibers.

In Midorikawa '784, there is a specific case wherein the carbon fiber is used (Reference Example 2), but because the short fibers are not in orientation with the thickness of the tread, they do not comply with or satisfy the equation $1.1 \leq E1/E2 \leq 4$, which is an element of the instantly claimed invention.

In other words, these references do not disclose tire treads such that small amounts of glass fibers or carbon fibers

with relatively high elastic modulus are added and are perpendicularly oriented with the tread surface, thus satisfying the claimed formula, $1.1 \leq E1/E2 \leq 4$.

It is only after small amounts (3-20 parts by weight) of glass fibers or carbon fibers are used as short fibers that the equation $1.1 \leq E1/E2 \leq 4$, an element that is claimed, is satisfied. Moreover, by using small amounts of glass or carbon fibers, this makes it easier for the fibers to disperse and orient within the rubber compound allowing the above formula to be satisfied. The fact that the value of E1/E2 meets the aforesaid range when the proportions of the short fibers are reduced is described in the present written description at page 6, line 25 to page 7, line 1, and is also clear from Comparative Example 4. Specifically, in Comparative Example 4, in which 30 parts by weight of glass fiber is compounded, the numerical value 4.15 of E1/E2 is greater than 4 (and thus, is outside the claimed range). As a result of having an E1/E2 of 4.14 or outside the claimed range, the tire has adhesion and adhesion friction that is diminished.

One of ordinary skill in the art would surmise that the numerical range of E1/E2 of the present claim is met only when small proportions of specified short fibers are compounded into the rubber compound. Moreover, the performance on ice appears best when not only small amounts of short fibers are oriented to

the tread thickness direction, but also when rubber hardness is defined as in the present invention.

Thus, even if all of the elements of the instant invention were met by the cited references, which Applicants do not concede, the instant invention shows unexpected advantages that could not be surmised by the cited references.

For the above reasons, Applicants submit one can not arrive at the instant invention by using JP '204 in view of JP '603 and JP '214 and optionally further in view of Lucas '211 and/or Midorikawa '784. The rejection is inapposite. Withdrawal of the rejection is warranted and respectfully requested.

With the above remarks and amendments, it is believed that the claims, as they now stand, define patentable subject matter such that a passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of $110.00 is attached hereto.

If any questions remain regarding the above matters, please contact Applicant's representative, T. Benjamin Schroeder (Reg. No. 50,990), in the Washington metropolitan area at the phone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) A studless tire, wherein [non-metal staple] glass fibers or carbon fibers having an average fiber diameter of 1 to 100 μm and an average length of 0.1 to 5 mm are dispersed in a diene rubber in an amount of 3 to 20 parts by weight based on 100 parts by weight of the diene rubber in such a way that the [non-metal staple] glass fibers or carbon fibers are oriented in a thickness direction of a tread, a complex elastic modulus E1 in the thickness direction of the tread and an elastic module E2 in a circumferential direction of the tire measured at 25°C satisfy the equation $1.1 \leq E1/E2 \leq 4$, and hardness of the tread rubber measured at -10°C is 45 to 75 degrees.

Claims 2 and 3 have been canceled.